Fraser River Estuary
Management Program

SUMMARY OF ACTIVITY PROGRAMS AND PROPOSED FRAMEWORK FOR ACTION

Fraser River Estuary Management Program
New Westminster, B.C., Canada

February, 1992

Government of Canada Gouvernement du Canada

Province of British Columbia

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1.0 THE VISION: A LIVING RIVER

The Fraser River estuary is a magnificent marine and intertidal environment with some of the most productive biological systems in Canada. It serves a wide range of human uses, including port and industrial development, recreation, residential and agricultural uses. The estuary is surrounded by the Greater Vancouver urban area, with a population of 1.5 million which continues to expand, imposing ever increased pressures on the natural environment.

In 1977, the governments of Canada and British Columbia initiated the first phase of the Fraser River Estuary Study with the objective of producing an inventory of existing environmental and land use conditions and trends and preparing a management program for addressing environmental and development issues in the estuary. The 1982 report, *A Living River By The Door* described the results of the second phase of the study and set out a proposed management structure for the estuary. It provided a vision of the Fraser River estuary to guide the management endeavors: a healthy natural river and estuary environment, valued for its intrinsic qualities and serving a range of important biological, social and economic functions. Subsequent review of the results of the Fraser River Estuary Study led to the publication of An Implementation Strategy for the Fraser River Estuary Management Program in 1984.

On the basis of the above studies and reports, the Fraser River Estuary Management Program (FREMP) was established in 1985 by a five-year agreement involving Environment Canada, B.C. Ministry of Environment, Fisheries and Oceans Canada, North Fraser Harbour Commission and the Fraser River Harbour Commission. The Program is a cooperative effort of Federal and Provincial government agencies, port authorities, regional districts, local municipalities and Indian Bands to coordinate decision making on conservation and development in the estuary.

FREMP is based on a "linked management" concept which focuses on strengthening the linkages among existing agencies rather than creating new agencies. A basic principle of the Program is that the primary responsibility for improving the management of the estuary will continue to rest with those agencies which currently have management authority. The emphasis, therefore, is on the development of coordinated and cooperative policies and programs for estuary management.

The goal of the Fraser River Estuary Management Program is:

> ***To provide the means for accommodating a growing population and economy while maintaining the quality and productivity of the Fraser estuary's natural environment.***

The boundaries of FREMP encompass the land and water areas outside of the dykes of the Fraser River from Kanaka Creek and the outlet of Pitt Lake at the eastern limit, to the estuary drop-off in the Strait of Georgia at the western limit, Point Grey to the north and Boundary Bay and Semiamhoo Bay to the International border at the southern limit. These boundaries are shown on Figure 1.

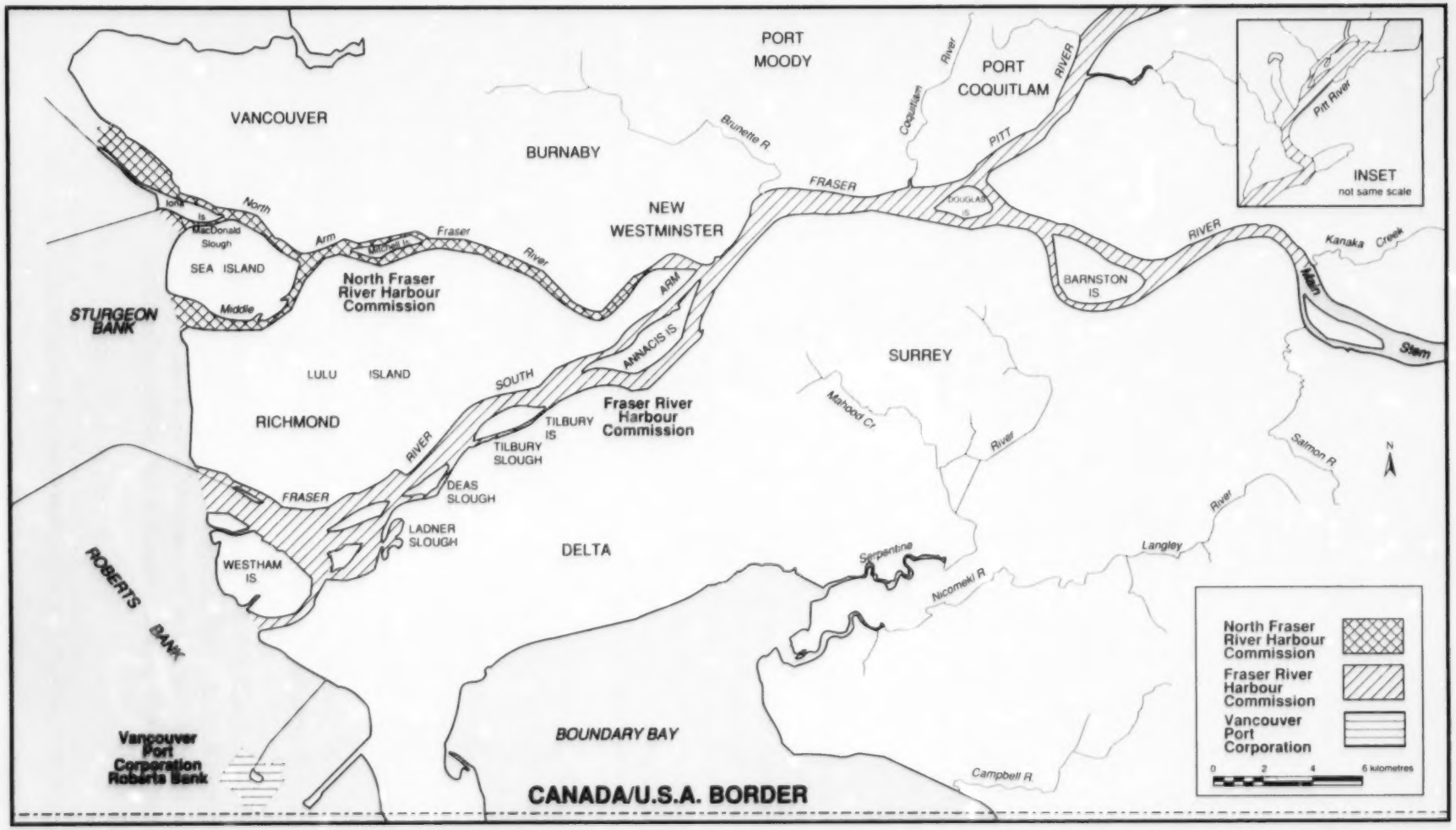


Figure 1: The Fraser River Estuary

The purpose of this report is to summarize the results of FREMP to date and to propose an action program for the 1991-1994 period. The report presents a brief summary of the major functions which FREMP has undertaken over the past five years. The Activity Programs and the Coordinated Project Review Process are discussed in Sections 2 and 3. In Section 4, the accomplishments of FREMP and the challenges of the next phase are described. A proposed implementation framework for this next phase is presented in Section 5.

2.0 THE ACTIVITY PROGRAMS

Seven Work Groups were established to review specific activities related to port and industrial development, navigation and dredging, log management, waste management, recreation, habitat and environmental emergencies. In addition, a Federal-Provincial Standing Committee was initiated to prepare a water quality plan for the estuary.

The recommendations of each of the Work Groups and the Standing Committee are summarized below. Details of the analysis are available in their individual reports which are listed in Appendix 1 along with the members of the Work Groups and Committee. To assist presentation, the fifty recommendations identified from the reports are numbered consecutively. These are the recommendations of the specific Activity Programs and have not necessarily been endorsed by the Management Committee Executive of FREMP. The adoption and implementation of these recommendations is discussed in Chapters 4 and 5.

2.1 PORT AND INDUSTRIAL DEVELOPMENT

The Port and Industrial Development Activity Work Group was formed to examine development trends and future land requirements for industries requiring sites with access to the waters of the Fraser River estuary over the next 20 years.

There are about 200 industrial companies which currently require waterfront locations or access to the waters of the Fraser River, Pitt River and the outer banks of the estuary, including approximately 40 wood-processing mills, the largest concentration of mills in the province.

The report of the Work Group assessed the issues and trends that affect waterfront industrial land development in the estuary. It notes that broad economic factors and global trends may also impact on the forecasts for development of waterfront lands. Excluding these influences, the forecasts indicate that there will be a critical shortage of waterfront industrial land by 2010 unless actions are taken now to protect the supply of undeveloped waterfront industrial land.

There is potentially 15,000 acres of industrial lands available in the Lower Mainland. The supply is adequate to meet demand for the next 20 years, but within 10 to 15 years there could be little remaining land available for water-dependent industries. The Work Group identified trends in waterfront industrial land use and the likely development scenarios between 1990 and 2010. The key concerns which emerged from the study were:

- the loss of waterfront industrial land base;
- the need for coordinated and integrated planning;
- the need for environmental protection to be built into the planning process;
- the need for public information and education in the implementation of the strategies.

The Work Group recommends six major strategies:

1. Encourage Nodal Development

The conflict between industrial and other land users results partly because users have located in ribbon-like fashion over much of the length of the study area. Land use conflicts could be lessened if industrial development were to occur in defined areas.

By concentrating future industrial development in nodes (large industrial areas 300+ acres), it will be easier to reach consensus on the boundaries between competing uses, minimize land use conflicts and conserve the supply of land for water-dependent industries. The Work Group identified 32 concentrations of industrial activity in the estuary. They recommend two options for implementing the nodal development strategy:

(1) Land banking by government agencies for the purpose of maintaining an adequate supply of land for water-dependent industries.

(2) Adding additional lands to the regional industrial land inventory beyond the areas currently designated by municipal governments for industrial use.

2. Encourage More Intensive and Efficient Use of Present Industrial Sites

The Work Group recommends that FREMP explore the feasibility of intensifying and improving use of existing industrial sites by:

- identifying sites which could be used more intensively or efficiently;
- identifying and selecting pilot or demonstration projects which could demonstrate the concept;
- developing a plan for involving the appropriate parties in the planning of the sites and for resolving perceived conflicts;
- assessing the servicing requirements and costs to resolve problems on the sites;
- identifying areas no longer being utilized which could be rehabilitated for other uses;
- identifying mechanisms for cleaning up obsolete sites.

3. Pursue a Coordinated Approach to Long-Term Water-Dependent Industrial Land Use Planning

The Work Group recommends that FREMP advocate a more coordinated approach to planning in the estuary. In particular, it is recommended that the GVRD be encouraged to take the lead in this process, forming a subcommittee to the GVRD's Technical Advisory Committee comprised of representatives from each municipality. This committee would discuss issues in planning for waterfront development, exchange information and reach consensus on how best to ensure an adequate supply of land for water-dependent industry.

4. Require Industry to be More Environmentally Responsible

There is a need to develop consensus on the basic environmental standards for development and to advise industry and developers of expectations for protecting the quality of the environment in constructing new facilities. The Work Group recommends that the principles of habitat mitigation and habitat compensation be communicated to industry to ensure that valuable habitat resources are protected.

5. Increase Awareness and Understanding of Water-Dependent Industry Needs

The Work Group recommends that FREMP, in conjunction with GVRD, initiate:

(1) **an Information Program:** to disseminate comprehensive information regarding future land use requirements for water-dependent industries, potential conflicts with other uses, and the costs and benefits of pursuing alternate courses of action in providing additional waterfront land, etc.

(2) **an Ongoing Consultation Process:** to create the opportunity for interested parties (industrial and public users of the river, elected officials, regulators and the interested public), to participate in the planning process for future marine terminals and water-dependent industries in the estuary.

6. Support Recreational Land Use in the Estuary

The Work Group recognizes and supports the need for waterfront recreational areas and endorses the concept of recreational units embodied in the proposed Recreation Plan. Development and recreational interests must agree on the location of proposed industrial nodes and recreational pods.

The Work Group recommends that additional work be undertaken to ensure that proposed recreational pods are planned to be compatible with existing and future industrial nodes. Towards this end, it was recommended that the Management Committee Executive develop a structure where competing users may meet to exchange views on the future FREMP planning process.

2.2 NAVIGATION AND DREDGING

The Navigation and Dredging Activity Work Group of the Fraser River Estuary Management Program was formed to identify the future dredging and navigation channel requirements on the lower Fraser River and the environmental and engineering implications of these requirements. Dredging is mainly associated with navigation channel development and maintenance but also involves marinas, fishing harbours, moorages and berths, log handling areas, land reclamation and sand sales.

A full range of marine traffic is dependent on these dredging activities including fishboats, barge and log-tows, pleasure craft, coastal vessels and deep-sea shipping. Cargo ships utilize the additional water depth generated by the daily high tides to traverse the river upstream to New Westminster. Ships of a maximum 10.7 metre draft have a minimum two hour window between Sandheads and New Westminster to enter or leave the port, 95% of the days of the year. Dredging and river training structures are an integral part of the navigation system on the lower Fraser River.

The report of the Work Group identified major issues which need to be addressed in the coming years, including:

- reliable navigation channel depth;
- future port and channel development;
- environmental guidelines for dredging;
- dredging effects on the sediment budget;
- contaminants testing procedures and standards;
- availability of dredge material disposal sites;
- habitat designation and enhancement; and
- navigation safety.

Every year the Fraser River carries over 17 million tonnes of sediment, measured at Mission. The sediment deposited in the channel creates shoals and high spots that are hazardous to navigation and need to be removed to ensure safe water depths for marine transportation. Most of the sediment infill occurs during the spring runoff period. Over the past decade, total dredging has averaged about 5.5 million m3/year with borrow dredging reaching up to 3.0 million m3/year. Currently, about one-half of the total is removed directly by Public Works Canada and by contractors for maintaining navigation channels. The remainder is removed through borrow dredging by private contractors and where possible, is targeted to assist navigation channel maintenance.

Five general trends are observed in the report of the Navigation and Dredging Activity Work Group:

- increased port growth is anticipated and future dredging and channel improvement requirements will depend on specific port development plans;
- local land development trends are likely to cause shifts in port development toward the South Arm and upstream of New Westminister, which may create new demands for navigation channel improvements and additional aids to navigation and marine services;

- borrow dredging, which depends upon construction activity, has played an increasing role in assisting navigation channel maintenance, but uncertainties exist about the effects on the sediment budget of further increases in borrow dredging;
- the availability of convenient disposal sites for dredge material is declining. This is resulting in greater pumping distances, double handling of material and higher disposal costs;
- water quality and habitat protection have become major concerns. Site specific conflicts are likely to increase regarding the removal and disposal of contaminated sediments.

In order to address many of the issues related to navigation and dredging, six recommendations are proposed.

7. Evaluation of Navigation Channel Requirements

Port planning and development in the estuary should include evaluation of the specific requirements for navigation channel improvement and maintenance, and assessment of environmental and socio-economic effects of required dredging and river training.

8. Dredge Disposal Management Plan

A management plan should be developed to provide for the designation of dredge disposal sites and the procedures for future disposal of dredge material in the vicinity of the regular maintenance dredging locations on the main navigation channels in the Fraser River estuary.

9. Sediment Budget Monitoring

Monitoring of the sediment budget and the morphology of the delta should be undertaken on a regular basis in order to evaluate the effects of dredging and other channel development activities.

10. Dredging Guidelines Revisions

The current Fisheries and Oceans Dredging Guidelines should be revised to include more detailed environmental guidelines for dredging approval procedures and operational methods.

11. Contaminated Sediments Research

A research agenda and program, along with mechanisms for consultation should be established by government and industry to address the identification, removal, management and disposal of contaminated sediments.

12. Navigation Advisory Committee

A Navigation Advisory Committee should be established by the Coast Guard, port authorities and mariner groups to provide consultation on navigation aids and services and the practices and procedures which will serve to enhance navigation safety on the lower Fraser River.

2.3 LOG MANAGEMENT

The Log Management Activity Work Group was formed to analyze the supply and demand for log storage in the estuary and to identify potential modifications to the log handling and storage system. There are currently 40 wood processing operations located in the estuary. They consume 25 percent of coastal timber production, employ 9,400 people at an annual payroll of over $260 million, and generate a sales value of final products of approximately $ 650 million (1984), of which 55 percent is exported to foreign markets. Efficient and constant delivery of raw logs to each of these operations is necessary for consistent production.

River storage needs are related to the overall logging operation season on the coast of British Columbia and must take into consideration inconsistencies of delivery due to freshet, logging closures due to fire, and adverse weather conditions. In addition to a base inventory of about one and a half months supply, storage is needed for logs destined for other locations in need of temporary protection against marine borers. Other logs, unsuitable for processing, need storage until sold or traded. Log trading and brokerage firms also use the river for storage until logs are sold. The volume of logs flowing through the area is 25 percent greater than the volume consumed by processing plants. This places a heavy demand on the estuary, one that is fairly consistent throughout the year.

The Log Management Activity Work Group determined that the supply/demand ratio is essentially balanced and provides industry with needed freshwater storage space. Provided there is no significant loss of storage space or a significant increase in production requiring more space, the supply/demand ratio should remain more or less in balance. Issues nevertheless remain regarding the security of storage areas and concerns about the biological effects of log transport and storage.

The following recommendations were presented by the Log Management Activity Work Group:

13. Debris Control Plans

The Work Group recommends that FREMP work with the B.C. Debris Control Board and other controlling agencies to determine what plans might exist to provide debris control in areas where it is not currently controlled.

14. Industry-Recreation Cooperation

The Work Group recommends that FREMP develop a mechanism to provide for interaction between industry and recreational resource managers to explore opportunities for the two activities to improve co-existence.

15. Log Storage Area Designation

(1) The Work Group recommends that FREMP continue its Area Designation Process to determine what log storage areas will be protected by zoning authorities.

(2) The Work Group recommends that industry consider the use of log storage areas outside the FREMP boundaries for storage of logs not consumed by mills in the estuary.

16. Log Storage Riparian Rights

The Work Group recommends that industry, through COFI, conduct a study to determine the amount of log storage protected and not protected through riparian ownership.

17. Technological Changes

The Work Group recommends that FREMP commend industry for its pursuit of technology which contributes to efficiency and reduces impacts to the estuary, and record its interest in encouraging industry and its individual members to continue the pursuit of such technological advances. Wherever possible, in-water bundle breaking should be phased out in favour of whole bundle lift facilities.

18. Log Towing Restrictions

The Work Group recommends that towing logs in shallow intertidal areas be restricted to high tide/high water cycles in order to minimize scouring of sediments and bottom disturbance. Log sorting activities in shallow sloughs and areas of poor water circulation should be avoided. Potential problem areas should be identified by the FREMP Environmental Review Committee and corrective measures recommended.

19. Log and Barge Dumping Restrictions

(1) The Work Group recommends that the violent, free-fall dumping of logs into the river be discouraged because it is a major cause and point source of loose bark and other log debris. Easy let-down devices should be used to place logs in the water, thereby reducing bark separation and generation of other wood debris.

(2) The Work Group recommends that industry should consider the use of "bag booms" to corral debris generated from barge dumping. Barge dumping activities should be scheduled to occur during high tide/high water cycles where possible.

20. Grounding Guidelines

The Work Group recommends that logs not be stored at geodetic elevations higher than the topographical line established by the 1986 FREMP Log Handling Activity Work Group Geodetic survey, i.e. 0.5 m below the lowest elevation for emergent plant communities for areas in the Fraser on a reach by reach basis. Implementation of the guidelines is now underway.

2.4 WASTE MANAGEMENT

The Waste Management Activity Work Group was formed to examine the nature of waste management concerns in the estuary and to develop recommendations to address these concerns. Areas of concern were categorized by discharge type, based on concerns expressed by member agencies, technical experts, and the public, and were priorized into (a) sewage treatment plants, (b) industrial effluents, (c) urban runoff and combined sewer overflows, (d) agricultural wastes and rural runoff, (e) groundwater contamination, and (f) miscellaneous wastes. Some are estuary-wide issues common to a number of discharge types, such as special wastes, compliance, and enforcement concerns.

The Recommended Waste Management Activity Plan was developed by the Work Group by considering the relative impact of the various sources and types of contaminants on the Fraser River estuary. Detailed appendices to the Plan summarize the relevant legislation, and provide the background and context to waste management including the natural characteristics of the Fraser River, contaminant loadings and other information. The Plan addresses guiding principles, pollution abatement for each area of concern, database management, education and public awareness, administration and research directions. The Work Group provided 28 recommendations grouped into the following six headings.

21. Guiding Principles

Principles for pollution control in the Fraser estuary have been articulated in the past but these have not been drawn together into cohesive policy guidelines. The recommendations are as follows:

(1) Reduce the entry of pollutants to the Fraser estuary through the use of Best Available Control Technology (BACT) for conventional pollutants and through the use of Lowest Achievable Emission Rate Technology (LAER) for toxic or hazardous pollutants.

(2) Implement source control, recycling, or production methods that avoid creation or discharge of wastes.

(3) Apply economic incentives to encourage resource conservation and reduce direct or indirect discharges of waste to the estuary.

22. Pollution Abatement

Some pollution abatement initiatives for pollution control in the Fraser estuary have already been implemented or are under development by the responsible agencies. The recommendations of the activity plan are as follows:

(4) Implement industrial and commercial sewer use source control.

(5) Upgrade the Annacis and Lulu Island Sewage Treatment Plants.

(6) Restructure the annual permit fee schedule set out in the Waste Management Fees Regulation of the Waste Management Act to incorporate effluent quantity and quality surcharges.

(7) Develop and implement source control and treatment options for urban runoff and combined sewer overflows.

(8) Implement a viable household hazardous waste collection and disposal program.

(9) Reduce waste loadings from agricultural sources.

(10) Control, collect, and treat leachates.

(11) Control contaminant loadings from sources such as floating homes, shipping, water contact structures, and upstream sources.

23. Database Management

There is a need for timely reporting of research and monitoring data. The plan recommends the following:

(12) Consider interagency compatibility and needs when developing or modifying computerized databases.

(13) Provide annual data reports summarizing effluent discharge flows, total loadings, and quality to FREMP to be published as part of a periodic status of the estuary report.

24. Education and Awareness

Public involvement and awareness leads to voluntary compliance with the intent of pollution control regulations. The recommendations of the plan are as follows:

(14) Keep public informed and encourage public interest group public awareness programs or initiatives to make use of the FREMP office.

(15) Revise, update, and publicize Agency Guide.

(16) Have regular technology transfer seminars.

(17) Develop a process to have companies conduct waste management audits.

25. Administration

Administrative procedures could be restructured to enhance waste management activities. The plan recommends the following:

(18) Name lead agencies to deal with areas of jurisdictional conflict or legislative inefficiency such as floating home and shipping discharges, and woodwaste.

(19) Revise all Pollution Control Objectives and establish criteria for their use.

(20) Develop a Surveillance and Enforcement Strategy for the estuary.

(21) Continue to develop guidelines regarding abatement of contaminants from specific sources.

(22) Construct a British Columbia Special Waste Facility.

(23) Staff and fund FREMP at a level that facilitates implementation of the Activity Program recommendations.

26. Research Directions

The plan recommends the following:

(24) Perform chronic toxicity and zones of influence characterization studies under a variety of river flow conditions.

(25) Perform research on environmental effects and pathways, areas of impact, and significance of air emissions on precipitation runoff quality.

(26) Prepare an inventory of farm types and agricultural waste discharge points for the FREMP area.

(27) Perform research regarding enhancement of laboratory procedures and functions.

(28) Establish a research fund.

2.5 WATER QUALITY

The Standing Committee on the Fraser River Estuary Water Quality Plan has prepared a plan to establish agreed upon water quality objectives and coordinated environmental monitoring. The plan reviews the existing programs and presents a program to improve the monitoring of water, sediments and fish and wildlife, and the measurement of environmental quality in the estuary. The current programs include the Fraser River Estuary Management Program, North Fraser Harbour Environmental Plan and the Greater Vancouver Regional District Liquid Waste Management Plan.

Sources of contaminants entering the Fraser River Estuary include: municipal and industrial liquid waste discharges, including stormwater and combined sewer overflows, non-point source discharges (e.g. leachates and agricultural runoff), dredging and dumping of sediments, upstream sources and atmospheric inputs. The development of the Water Quality Plan required a comprehensive review of the foregoing sources because the contaminants discharges can cause toxic impacts and degrade habitat for fish and wildlife populations.

The plan addresses six major components, as described below.

27. Water Quality Objectives

Water Quality Objectives are limits set for physical, chemical or biological characteristics of water, sediment or biota which will protect designated water uses and are one instrument used in protecting and improving the quality of the estuary. A mechanism is provided in this plan for the establishment of agreed upon Water Quality Objectives. The information used to establish a new or revised Water Quality Objective is similar to that used by the provincial government in setting provisional objectives. A monitoring program to assess compliance with the Objectives is discussed along with priority areas for objectives development.

28. Environmental Monitoring

A major component of the Water Quality Plan is a coordinated monitoring program designed to:

(1) determine the current status of ambient environmental quality, assess trends and gauge compliance with Water Quality Objectives;

(2) obtain data in sloughs where environmental extremes may occur;

(3) identify areas where enforcement and/or abatement action may be needed; and

(4) provide information for the revision and development of Water Quality Objectives.

The monitoring program is designed to operate on a three-year cycle with effluent and water sampling conducted during the first year; sampling of sediments, invertebrates, heron eggs and water in the second year; and fish and water in the third year. Effluent sampling in Year One would be directed at establishing priorities for sampling of sediments, invertebrates and fish in the subsequent hydrological cycle. Sediments and invertebrates would be sampled toward the end of fiscal Year Two; with fish sampling occurring early in fiscal Year Three, within the same prefreshet hydrological cycle.

This apportionment of work addresses both technical and financial consideration in the planning and implementation of the program. The number of sampling sites and species of biota, chemical analyses, replicates and quality assurance/quality control procedures were selected to provide the minimum level of information required to adequately assess the quality of the environment. The three-year cycle will produce trend data for contaminants in the estuary and allow assessment of the degree of contamination in the estuary and allow assessment of the degree of contamination of receiving waters and biota. Resources beyond those identified for the monitoring program would be required to improve understanding of the acute and chronic effects of contaminants on biota.

29. Special Studies

A number of Special Studies which concentrate on specific environmental problems in the estuary or have a definite research orientation are identified in the Plan. These include both required and suggested special studies. Such programs if implemented, would provide an information base for refining the routine monitoring program.

30. Quality Assurance and Quality Control

The Plan provides an outline of the minimum quality assurance/quality control requirements for different aspects of the monitoring program. Sampling and analytical protocols are to be developed so as to provide comparability of data with previous studies and monitoring.

31. Plan Coordinator and Quality Assurance/Quality Control Officer

The Standing Committee recommends that, because of the magnitude of the proposed FREMP water quality program, the program should be carried out through a Plan Coordinator reporting to the Standing Committee or equivalent federal/provincial body. The Plan Coordinator should be supported by a QA/QC Officer, responsible for ensuring the quality of the data through the development of protocols for all aspects of sampling, analysis and data handling, and the ongoing quality control audit of the program. The Plan Coordinator and the QA/QC Officer could either be staff added to the complement of the participating agencies, or contract employees. It is assumed that the work of the monitoring program itself would be carried out using contract funds, or through a combination of in-house resources and contract funds.

32. Public Education and Involvement

The Standing Committee also supports various education and involvement programs, including:

(1) an annual report card type brochure on the status of environmental quality in the estuary;

(2) annual public presentations on the status of water quality and research and monitoring activities in the estuary;

(3) a comprehensive video or slide tape presentation on FREMP and different aspects of protecting the environment;

(4) an education package, in conjunction with the Ministry of Education, on environmental protection; and

(5) various public involvement programs such as the Storm Drain Marking Program, citizen patrols, adopt a stream/beach programs, etc.

2.6 HABITAT

The Habitat Activity Work Group was established to address estuary-wide issues related to fish and wildlife habitat management. Areas of concern were identified, conclusions developed and recommendations made on issues related to five topics: habitat protection and conservation, restoration and enhancement, management plans and programs, public awareness and workshop results.

In its review of habitat protection and conservation, the Work Group concluded that recent applications of the Department of Fisheries and Oceans' "No Net Loss Fish Management Policy" have substantially improved the protection and conservation of fish habitat. Recent progress in the application of the Environment Assessment and Review Process (EARP) has also greatly improved the environmental review of federal projects. However, they also concluded that existing environmental legislation is not adequate to protect and conserve all important habitat for fish and wildlife in the Fraser River estuary. Acquisition of key habitat areas, an important element in habitat conservation, has been limited in extent and many critical habitat areas remain unsecured. Wildlife habitat compensation is currently pursued under regional working guidelines. The establishment of a formal policy would improve the agencies' abilities to protect wildlife habitat.

Habitat restoration and enhancement is a major means of providing for the habitat needs of fish and wildlife. A number of successful projects have already been undertaken in the estuary. Restoration and enhancement activities are relatively recent undertakings in the estuary and therefore industry and all levels of government need to be encouraged to become more active participants. Also, an overall habitat restoration and enhancement plan or strategy would offer the necessary guidance for future projects. The Work Group recommends the preparation of a comprehensive habitat management plan for the estuary, including better links between aquatic and terrestrial habitats.

The potential also exists to improve public awareness, and education concerning habitat in the estuary and habitat-related project proposals. For example, a public interpretive resource facility would offer an accessible overview of information on the Fraser River estuary.

Based on the FREMP habitat workshop results, a number of data gaps and uncertainties related to the ecology of the Fraser River estuary were identified. Results of directed research efforts will continue to play an important role in improving our ability to manage the habitat. Habitat-related research funding in the last decade has been quite limited and needs to be improved. It has also had a limited ecological scope. The various agencies engaged in research studies could substantially enhance the ecological database by coordinating their efforts in the Fraser River estuary.

The following recommendations are considered by the Work Group as being of utmost priority:

33. Protection and Conservation

Regulatory means must be developed and coordination and enforcement of existing regulations must be improved to better protect wildlife habitat.

34. Restoration and Enhancement

(1) Degraded habitat areas with high potential for restoration must be returned to their former productivity.

(2) Habitat restoration and enhancement plans must be developed and coordinated by the Work Group successor, which must also ensure that the plans are implemented.

35. Management Plans and Programs

(1) Adequate funding and resource commitments from participating agencies at all levels of government is a prerequisite for the proper implementation and success of all future FREMP programs and activities.

(2) The Habitat Management Plan developed by the Work Group successor and adopted by the future FREMP must be based on the following:

- It must be a proactive, estuary-wide plan that takes into account the complete inventory and classification of habitat.
- Administrative and working-level linkages must be established with other programs and planning efforts which affect habitats in the estuary.
- It must tie into regional and municipal land-use the need for natural open areas, wetlands, parks, and agricultural lands which serve as valuable habitat.
- It must provide for a net gain in the quantity of habitat over time.
- It must be linked to basin-wide planning.

36. Public Awareness

(1) The opportunities for public involvement in the various environmental review processes must be improved by better advertisements of project proposals and by the Environmental Review Committee (ERC) issuing an annual report.

(2) A network of Environmental Interpretation Centres is needed for the Fraser River estuary.

(3) A regular meeting must be held at least each year to discuss habitat research, issues, and concerns.

37. Habitat Research

Ecological research and management must be undertaken as a cooperative effort amongst the various government agencies, and other groups and organizations, and should include the following:

- FREMP must have a Standing Committee on Estuary Research to coordinate multi-agency research projects.
- The habitat dependencies of key fish and wildlife components need to be determined by experimental research.
- The role of fish and wildlife food organisms as bioindicators of contamination and the functions of marshes and other aquatic plant communities as biofilters must be investigated.
- New funding for accelerated efforts in ecological research must be considered through such means as the imposition of ecological surcharges on development or other suitable means.

2.7 RECREATION

The Proposed Recreation Plan of the Recreation Activity Work Group describes existing facilities and future action plans for sixteen recreation units within the FREMP management area. In addition, it outlines principles for recreation along the Fraser River and recommends actions to implement the plan.

The objectives of the Recreation Plan are to:

- Provide an integrated system of Parks, Linear Units (trails and water pathways) and street ends that give frequent and substantial access and view to the Fraser River.
- Reduce potential conflicts between recreational users and other river users by designing a multiple use approach to recreational development.
- Create a management model for the integrated recreation system (including existing and potential recreational sites so the recreation plan can be achieved by the many separate jurisdictions.
- Devise a recreation system and management structure that facilitates public communication, debate and modifications.

The lower Fraser River, its shoreline and foreshore represent a major recreation and educational asset for the region. The existing and potential recreation sites range from small access points to major stretches of river and foreshore sometimes backed by substantial uplands. Many are now receiving widespread and heavy recreational use.

The Recreation Plan states that the Fraser River recreational potential is under-utilized and that an effective program is needed to secure recreation as a primary or complementary use to other activities. The River and estuary should be recognized as a major open-space feature of our region and be accorded the same respect - for many economic and social reasons - as the mountain and marine perimeters of the region.

One way to build positive perceptions of the Fraser River is to bring people to the waterfront at every available location so that the various functions that the river fulfills can be explained and enjoyed. It is essential that there be enough established parks and recreation sites to form the backbone of a recreation system. Where possible, there should be linear connections between these sites along with industry viewing sites, street end access and signage identifying the river's other uses. At present, this task is made difficult because public access and recreation in general is interrupted by distance and differing jurisdictions throughout the estuary. A major challenge will be to unify the large number of vastly different and scattered sites into an organized system that uses the river's attributes effectively. The system should present practical opportunities for agencies to act independently and yet contribute to the whole system.

The central goal for recreation on the Fraser River is to maximize the variety, quality, scale, and accessibility of recreation opportunities on water and shoreline areas, in both riverine and tidal frontages. The Plan sets out both general principles and specific proposals for a system of recreational destinations throughout the estuary that will consist of a mixture of parks, trails and viewpoints located alongside and amongst other river users. Most municipalities have endorsed the Plan in concept.

38. Principles for the Fraser River Recreation Plan

(1) River and foreshore recreation must be an equal partner with conservation, housing, shipping and water-oriented industrial and transportation functions.

(2) High water quality standards throughout the riverfront and foreshore must be maintained and improved for wildlife and river-based recreation. Recreation must be environmentally sensitive and compatible to fisheries, wildlife habitat and other uses.

(3) Recreation should be used to educate people to protect and conserve the Fraser River. Cooperation with industry can enhance the education component and benefit the community.

(4) Major shoreline and foreshore units for recreation and combined recreation/conservation purposes are required to effectively sustain wildlife populations and to maintain environmental and visual qualities.

(5) Linear parks and street-end access points should play an important role in preserving and securing recreation values.

(6) New utility rights-of-way, dykes, industrial and port development should be designed to retain or expand recreation opportunities currently available.

(7) Revitalization and other changes to developed waterfront must accommodate recreation features and waterfront access.

(8) A process should be developed to resolve conflicts between recreational groups and other users.

39. Recreation Unit Plans

The Plan groups areas of similar recreational and geographical attributes into 16 "recreation units". Each unit has at least one natural area or park of regional significance, which is the principal attraction and core feature of the unit. Features range from small but significant natural areas located amongst river-oriented development, to large tracts of estuarine wild lands. Action plans for the 16 recreation units are presented in the report of the Work Group. Each unit should have at least one "staging area", often an existing park or recreation site, where parking, information and recreational facilities are provided.

40. Recreation Linear Units

Linear units comprise parks, trails, dyke paths and other routes which provide waterfront access and link recreation sites in the estuary. They can occur alongside and in conjunction with a variety of land uses such as agriculture, industry, housing, etc. The Recreation Plan identifies various existing and potential recreation corridors.

41. Development Policies

In order to assist in implementing the concept proposed in the Plan, policy guidelines are needed for recreation planning with new developments. The policy guidelines proposed by the Work Group stated that before any project in the estuary is granted approval and especially one within a recreation unit, it must provide the following:

- public access to the waterfront;
- if public access is not possible, then a viewing area with interpretive facilities;
- if public access is not possible, then a suitable pathway or connection through or around the development; and
- provision for public access along public dykes.

42. Communication and Education

It is recommended in the Recreation Plan that further attention be paid to education through the development of a "communication plan". This plan should identify agencies and industries that would be involved in educational opportunities to promote the FREMP objectives. Sites along the river at which information and education projects have potential would also be identified. Themes and conceptual designs would be developed in order that the communication and education is complete and consistent. It would also provide a guide for the interpretive component of each municipality's waterfront parks.

2.8 ENVIRONMENTAL EMERGENCIES

The Environmental Emergency Activity Work Group was appointed to review all emergency plans in the estuary, to identify overlaps, gaps and linkages between plans, and to propose solutions to improve the management of environmental emergencies. Environmental emergencies focus on oil and chemical spills and other events which threaten air and water quality and fish and wildlife.

A total of 26 emergency plans were reviewed: federal government agencies, provincial government agencies, port authorities, Crown corporations, regional and municipal governments, and industry. The review found considerable variability solely explained by differing mandates and jurisdictions. On this basis, improvements for contingency planning are proposed for industries which store or handle oil, or hazardous chemicals. Many individual plans are limited in scope and require updating and expansion, as noted in the reports of the Work Group.

Documented linkages between emergency plans are limited, even though for minor incidents there is evidence of few inter-agency coordination problems. In particular, inter-relationships between plans are seldom integrated into the response functions either between agencies or between specific agencies and industry. To improve integration, the Work Group recommends a joint planning process among its members. This would produce more integrated response procedures which could be tested regularly in a number of ways, including simulated spill response exercises.

Some significant improvements have been accomplished by the Work Group, including:

- a dedicated river oil spill equipment package established at Annacis Island;
- a formal agreement between the petroleum industry and the Fraser River Harbour Commission;
- improvements to pollution surveillance throughout the estuary;
- acquisition of specialized river equipment by the Canadian Coast Guard and the petroleum industry;
- a review of all contingency plans pertinent to the estuary;
- an analysis of equipment requirements and suitability;
- greater understanding and cooperation among government agencies and municipalities.

The following further actions are recommended by the Environmental Emergency Activity Work Group:

43. Spill Response Plan and Inter-agency Agreement

Area-wide joint environmental emergency response procedures should be established through a Spill Response Plan and related agreements. These procedures should allow for immediate response even if the polluter is unknown or the lead agency unclear. Private industry should be involved in this plan.

44. Emergency Response Committee

A standing committee involving government, industry and port authorities should be established to coordinate the operation of the Spill Response Plan.

45. Emergency Response Funding

A mechanism is needed to ensure that prompt spill response action and recovery of costs is provided in the estuary.

46. North Fraser Spill Response Equipment

An equipment package for the North Arm of the Fraser River should be established.

47. North Fraser Spill Response Manual

A coordinated spill response manual is needed for the North Fraser River.

48. Spill Training Program

Joint preparedness exercises should be undertaken to test the response procedures and improve the training of response staff.

49. Spill Modelling Systems

The Institute of Oceans Sciences should continue their efforts to develop improvements in spill trajectory modelling in the estuary.

50. Hazardous Chemical Spills Response

Further investigation of response procedures for hazardous chemical spills should be undertaken.

3.0 COORDINATED PROJECT REVIEW PROCESS

One of the most visible and tangible elements of the Fraser River Estuary Management Program is the Coordinated Project Review Process. The intent of this process is to overcome some of the traditional problems inherent in earlier project review mechanisms: lack of a systematic process for project assessments; duplication and lengthy reviews; inaccuracy and gaps in information available for decision-making; and inadequate linkage to the complex array of regulatory requirements.

Since 1985 under the process, all development projects proposed in the estuary (on the wetted side of the dyke or high water mark) are now referred to the Central Project Registry (a centralized filing system) located in the FREMP Secretariat Office. This office coordinates the environmental review among the relevant regulatory agencies. Proposals of a routine nature are reviewed within 30 days (Level 1 review). If a more detailed review is required, a recommendation is made to a Lead Agency to raise a project to a Level 2 or 3 review, which are incrementally more intensive and which may involve preparation of formal environmental impact assessments and public hearings. During the past five years over 500 projects have been assessed. The majority of these have been Level 1 reviews. Several projects were raised to a higher level of review, including the proposed jet fuel barge facility on Sea Island in Richmond (federal EARP review), Chatterton Petrochemical plant in Delta, the Tsawwassen Marina proposal, the proposed expansion of the B.C Ferries terminal in Tsawwassen and the realignment of the Steveston Jetty.

An Environmental Review Committee (ERC) comprised of federal and provincial environment and fisheries agencies meets bi-weekly to prepare a coordinated response based on the comments received from the various regulatory agencies. The ERC's response is sent to a designated Lead Agency. Depending upon the location of the proposed project, this would be either the Fraser River Harbour Commission, the North Fraser Harbour Commission or Crown Lands of the Ministry of Environment, Lands and Parks. The Lead Agencies are responsible for deciding whether or not to grant tenure and/or construction approval for a project. Satisfactory resolution of environmental and fisheries concerns is a prerequisite to granting project approvals. Environmental conditions are often included in lease and construction approval documents.

One of the basic tenets of FREMP is that primary responsibility for enforcement of mandates and jurisdictions rests with those agencies which have management and regulatory authority. FREMP is not an agency and has no regulatory enforcement powers. In the case of enforcing environmental requirements of specific projects, this is done through the individual regulatory agencies.

All project applications in the Central Project Registry are available for public review and comments by the public on any particular project application are welcomed by the Environmental Review Committee.

Project reviews are greatly assisted by the Habitat Classification maps prepared by the FREMP Habitat Work Group and the area designations. The Environmental Review Committee consults these maps in making its recommendations concerning project location and design. Increasingly, potential developers and applicants are consulting these maps prior to making formal application to the FREMP review process. The preparation of area management plans and further refinement of the area designations will provide additional direction and guidance to both review agencies and project developers.

With the introduction of the Provincial Major Project Review Process and the interpretation of the federal environmental assessment review process guidelines by the courts, the FREMP Coordinated Project Review Process is increasingly serving as an environmental screening mechanism for Provincial and Federal agencies. Further coordination efforts between these formal federal and provincial review processes and the FREMP review process will need to be undertaken in the next phase of FREMP.

Public concern has also been expressed over the notification process for project application in the Fraser estuary. In the next phase consideration will be given to having project applicants place notices in newspapers. The Secretariat Office will also provide updates of the Central Project Registry referral log to those who wish to be placed on a mailing list. An annual report on the activities of the ERC including the number and type of projects reviewed would also be valuable. A follow-up monitoring program to ensure compliance with ERC recommendations will also be considered in the next phase.

4.0 ACCOMPLISHMENTS AND CHALLENGES

4.1 PROGRESS TO DATE

The continual balancing of economic development and environmental protection objectives and interests is a major ongoing function of FREMP. Informed trade-offs and compromises are necessary in some cases in order to ensure coordinated and consistent management plans and strategies for the estuary. The dominant approach under FREMP has been to develop management guidelines and procedures which accommodate the needs of various stakeholders in the estuary. It is a cooperative process aimed at synchronizing and integrating the requirements of all interests. Over the past five years, FREMP participants have adopted, and continue to develop, innovative management guidelines for the estuary, including the introduction of:

- Log storage grounding guidelines;
- Habitat conservation and development classification guidelines;
- No net loss habitat management procedures;
- Nodal port and industrial development initiative;
- System of linked recreation units;
- Standardized waste discharge/water quality databases and data collection;
- Environmental quality reports and research agendas;
- Interagency environmental emergency response agreements between some agencies;
- Emergency response equipment improvements;
- Coordinated borrow dredging - navigation channel maintenance approvals;
- Fraser River dredging guidelines for fisheries protection;
- In-river public works maintenance guidelines.
- Area shoreline land use designations for certain areas;
- Coordinated project review procedures;

The major accomplishments of FREMP can be grouped into six general categories:

1. The establishment of better communications between estuary agencies and users so that current and proposed development and management practices take account of the concerns of other agencies and interests.

2. Clearer procedures regarding environmental impact assessment and environmental mitigation/compensation requirements for development in the estuary.

3. The development of more comprehensive and standardized databases and inventory information on habitat, recreation, waste discharge, water quality, navigation channels, log storage and land use.

4. The commencement of area designation agreements with certain municipalities, notably Burnaby, Richmond and Surrey, regarding the use of the Fraser River shoreline.

5. The preparation of estuary-wide management strategies based on a thorough technical review of issues by the Activity Programs, providing an agenda for action during the next phase of FREMP.

6. Improved public understanding of the estuary and FREMP objectives through various public information and involvement activities, (such as newsletters, technical reports, the Fraser River Festival, Activity Programs participation, annual water quality workshops, etc.) and by providing a central point of contact for information about development and management issues in the estuary.

4.2 TOWARDS AN INTEGRATED APPROACH

The analysis and recommendations of the Activity Programs provide the basis for an integrated management approach for the estuary. The objective in the next phase of the Fraser River Estuary Management Program is to further refine these various recommendations and to implement a coordinated program of management actions which will fulfill the overall goal of FREMP: protecting the natural environment of the estuary while accommodating a growing population and development.

Appendix 1 lists the 50 major recommendations of the Activity Programs. It is apparent that there are many common concerns and recommendations of the Work Groups, as well as some potentially conflicting issues. Some of the recommendations are currently being implemented under existing government programs. Others are proposed to be addressed under FREMP or other government programs. Still others will require further consideration of budget and resource commitments.

The Activity Program recommendations can be categorized into four types of actions or outputs to guide the next phase of FREMP:

Monitoring and Research - technical information necessary for environmental management in the estuary. This includes data collection proposed under the Coordinated Water Quality Monitoring Program, sediment budget monitoring, contaminated sediments research, and habitat inventory and research.

Policies and Guidelines - management directives, guidelines, programs and practices. This includes a range of program activities related to land use, log management, navigation channel maintenance, waste management, water quality management, habitat management, recreation and environmental emergencies.

Area Plans and Designations - land and water use allocation and long-term management plans. This is focused on the adoption of Area Management Plans and shoreline designations which incorporate a port and industrial land strategy, log storage requirements, dredge disposal requirements, a habitat plan and a recreation plan, in conjunction with municipalities.

Public Information and Consultation - programs to improve public awareness, education and involvement in the estuary. This involves both direct and indirect actions to promote better public information and understanding of the estuary.

4.3 POLICY DIRECTIONS

In order to continue the progress toward an integrated management approach to conservation and development in the estuary, some clear policy directions are needed. The emphasis during the next three years will be on developing closer involvement with municipalities, industries, estuary users and the public to refine and implement the various plans and technical recommendations of the Activity Programs of FREMP.

The following four policy statements provide the major focus for the next phase of FREMP.

Land and Water Use Plans

FREMP will work with local and regional governments to adopt integrated management plans for specific areas of the estuary, including area land use designations and management guidelines for port and industrial development, navigation channels, log storage, recreation, habitat and other uses.

Water Quality and Waste Management Programs

FREMP will provide coordination and assist in implementation of proposed programs for comprehensive waste management controls, water quality objectives and monitoring, and environmental emergencies response.

Coordinated Project Review Process

FREMP will continue to provide coordination of the environmental review of proposed development projects, in conjunction with Federal and Provincial agencies, local and regional governments and the public.

Public Involvement

FREMP will undertake and assist others in the development of an estuary-wide program for improved public information, awareness, education and involvement in the estuary.

5.0 IMPLEMENTATION FRAMEWORK

5.1 FREMP MANDATE

On June 1, 1991 the Federal and Provincial Environment and Fisheries Ministers, the Chairmen of the Fraser River and North Fraser Harbour Commissions and the Chairman of the Board of the Greater Vancouver Regional District signed an agreement renewing the Fraser River Estuary Management Program for a further three years. The agreement reaffirms the boundaries as outlined above. It commits the signatories to implementing a number of specific activities, including:

- the continuation of the coordinated project review process
- an area planning and designation process
- the establishment of a Management Committee comprised of representatives of the six signatories to the agreement
- the establishment of an Advisory Committee
- integration of and action on the recommendations of the Activity Program reports
- to facilitate implementation of a water quality plan and coordinated monitoring program,
- implementation of an enhanced public consultation and information program,
- a strengthened Secretariat Office.

The overall goal of the Management Program provides a mission statement within the framework of sustainable development. In addition, four specific goals are meant to guide the Management Program's activities and the work of its Committees (not in order of priority):

1. To maintain and where feasible increase the productivity of fish and wildlife habitat.
2. To maintain ambient water quality levels in the Fraser River, outer estuary, and Boundary Bay and Semiahmoo Bays that will ensure the preservation of fisheries and wildlife, and where suitable,provide for water contact recreation.
3. To provide opportunities for environmentally sustainable economic development in the estuary.
4. To enhance the quality and variety of estuary sites with identified recreational attributes.

This next section outlines the FREMP commitment to public consultation and information, proposes a Management Structure for implementing the activities of the next three year phase, and proposes objectives and work tasks to be undertaken by the various committees.

5.2 PUBLIC CONSULTATION AND INFORMATION

A fundamental principle of the Fraser River Estuary Management Program is the provision of public consultation opportunities and public information. A Statement of Public Consultation has been prepared to guide the program. Information is made available to the public through newsletters and announcements. Reports and minutes of meetings are available upon request. Individual or organizations may also meet with the Management Committee for the purpose of making a proposal or presenting concerns.

Various initiatives have been taken in the past to directly encourage interest and involvement, including:

- meetings between Work Groups and public interest groups
- public workshops on water quality
- presentations to community groups
- sponsorship of the Fraser River Festival
- displays presented at various environmental and community fairs and festivals
- issuance of The Fraser Estuary: An Overview of Changing Conditions
- issuance of Activity Programs reports (Appendix II).
- issuance of newsletters and facts sheets.
- issuance of a Guide to Coordinated Project Review Process and an Agency Guide.

The public information and consultation activities are proposed to be expanded during the next phase. There are principally five strategies which will be used to promote awareness of the estuary and the goals of FREMP.

(1) Information Programs

A variety of publications, newsletters, news releases and technical reports will be issued from time to time, including regular reports on the status of environmental quality in the estuary.

(2) Public Forums

Special events, such as the Fraser River Festival, the water quality workshop, and other special public sessions, will continue to be organized to provide information and to receive public comments.

(3) FREMP Secretariat

The FREMP office in New Westminister will serve as a central point of contact. The Secretariat will provide information on program activities and events, as well as arrange for meetings with the Management Committee and the technical committees.

(4) Coordinated Project Review Process

Detailed public information on any proposed project in the estuary is available from the Central Project Registry at the FREMP offices. Any member of the public may review the contents of the Registry file. If requested, copies of information on a file can be obtained. Any public comments and suggestions on a proposed project can be submitted in writing to the Secretariat. The Secretariat will ensure that the comments are forwarded to the Environmental Review Committee and the lead agency for consideration. Mechanisms for providing public notification of project applications will be considered.

(5) Area Management Plans

In the preparation of area management plans and designations, public consultation will be undertaken through:

- liaison with local government, directly and through the Advisory Committee;
- direct contact with local groups and advisory planning commissions;
- public meetings or workshops to discuss draft management plans.

5.3 PROPOSED MANAGEMENT STRUCTURE

The proposed management structure for FREMP is shown on Figure 2.

Management Committee - this committee will provide executive direction, with representation from B.C. Ministry of Environment, Lands and Parks, Environment Canada, Fisheries and Oceans Canada, Fraser River Harbour Commission, North Fraser Harbour Commission, and Greater Vancouver Regional District.

Technical Committees - these three committees, described in Section 5.5 below, will provide follow-up implementation of the Activity Programs recommendations, continuation of the area plans and designations, and environmental review of proposed development projects.

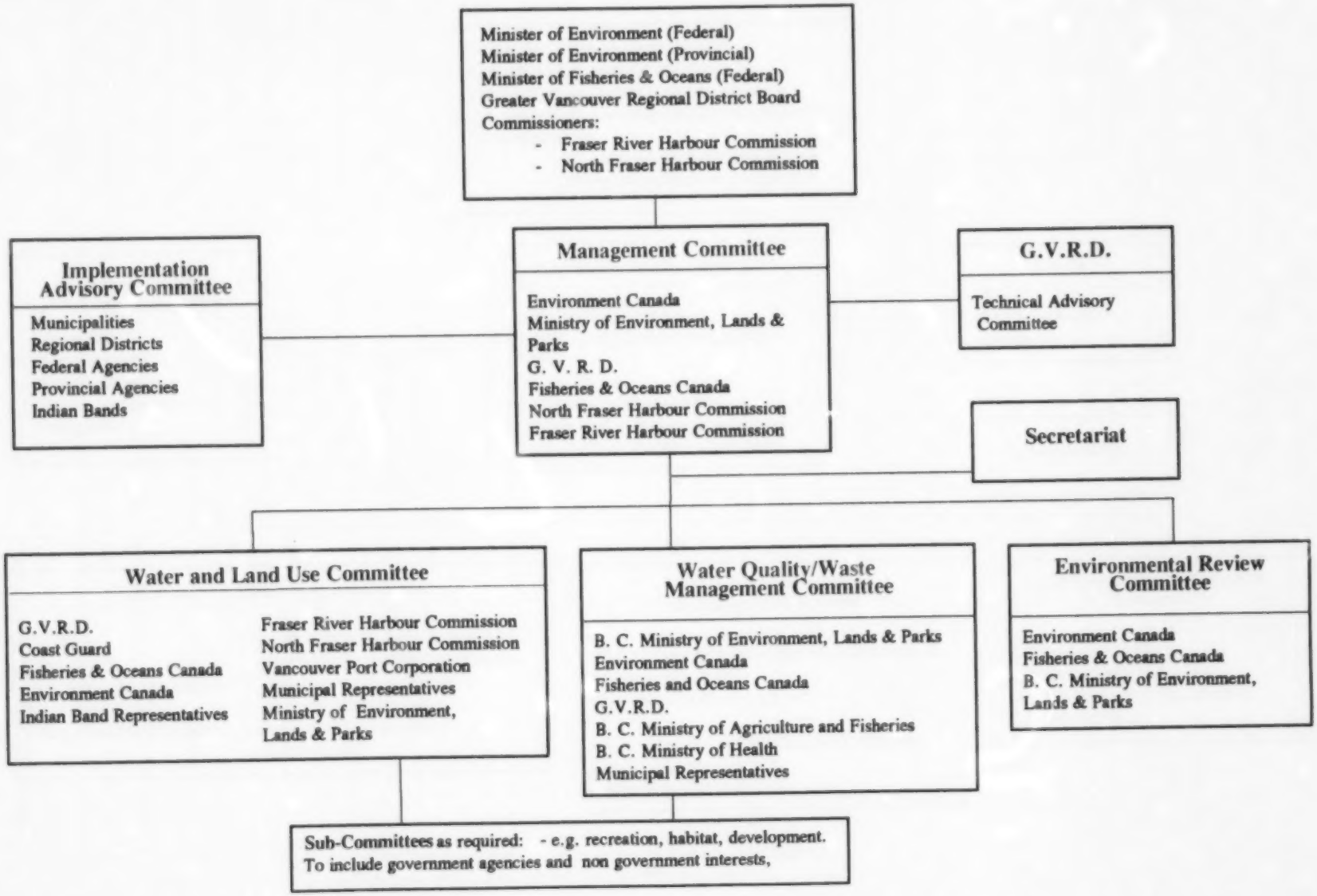
Implementation Advisory Committee - this committee is proposed to consist of representatives from federal, provincial, regional and local governments, and six Indian Bands. This Committee would review progress in implementing the Management Program.

Technical Advisory Committee - this committee, which advises the Development Services Department of G.V.R.D. would provide advice to the Management Committee particularly on the implementation of Area Management Plans.

Secretariat - the current staff is proposed to be increased to a full-time program coordinator, an office secretary and a public involvement/education specialist. Contract professional staff will provide assistance as required in the area of planning, water quality and environmental monitoring.

FRASER RIVER ESTUARY MANAGEMENT PROGRAM

2ND PHASE PROPOSED ORGANIZATIONAL STRUCTURE



5.4 MANAGEMENT COMMITTEE

It is proposed that the previous Management Committee Executive comprising those agencies which are signatories to the FREMP joint agreement be renamed the Management Committee and that this Committee assume the responsiblities of overseeing implementation of the Program, providing policy direction and financial control. The previous Management Committee as a whole which included representatives from municipalities, regional districts, Indian Bands and other federal and provincial agencies in the Program area is proposed to become the Implementation Advisory Committee. It is the intent of FREMP to work very closely with municipalities, regional districts, Indian Bands and other agencies in the proposed activities over the next three years, particularly in the committee work and in preparing area management plans and designations and in assisting with implementation of the recommendations of the various Activity Work Groups.

It is proposed that the Technical Advisory Committee of the GVRD which includes both official members and associate members, be used as an advisory body to the FREMP Management Committee. This will help to strengthen the ties between FREMP and local and regional levels of government.

5.5 TECHNICAL COMMITTEES' OBJECTIVES AND TASKS

The following preliminary statement of objectives and tasks of the three proposed technical committees is presented for discussion purposes.

5.5.1 Water and Land Use Committee

This proposed committee will be principally responsible for implementing four products:

(1) Area Management Plans which will address the long-term allocation of shoreline and water uses through coordination and cooperation amongst local, regional, Provincial and Federal governments,Indian Bands and port authorities. Work has commenced on the area designation activities of FREMP and should be further advanced to address the water and land use issues identified by the Activity Programs.

(2) Development Strategy to be prepared in conjunction with the area management plans, which will implement the concept of specific, compact nodes of port and industrial development, provide secure log storage arrangements to meet industry needs, and provide for safe navigation channels which are efficiently managed to serve the requirements of marine users.

(3) Recreation Plan to be implemented in conjunction with the area management plans, which will lead to development of a coordinated system of parks, recreation sites and routes for public access to the waterfront and provision of a wide range of recreational opportunities and interpretive facilities.

(4) Habitat Plan to be prepared in conjunction with the area management plans, which will further identify the important fish and wildlife habitat areas in the estuary and specify policies and opportunities for habitat protection, management and enhancement.

Proposed Water and Land Use Committee members:

GVRD (chairman)
Canadian Coast Guard
Department of Fisheries and Oceans
Environment Canada
Fraser River Harbour Commission
Ministry of Environment, Lands and Parks
(B. C. Environment and B. C. Crown Lands)
North Fraser Harbour Commission
Vancouver Port Corporation
Indian Band Representatives
Municipal Representatives

The Committee will undertake specific tasks related to preparation of Area Management Plans and implementation of the Development Strategy, Recreation Plan and Habitat Plan. Several Subcommittees to address specific activities (e.g. habitat, recreation) may also be formed. These would include invited representation from various agencies and special interest groups. The goals and objectives of the Committee are as follows.

Objective 1: ***To implement a regional port and industrial development strategy.***

Tasks:

(a) Determine specific land use options for long-term development of port and industrial nodes (including upland and navigation channel implications), as recommended by the Port and Industrial Development Activity Work Group.

(b) Determine current and future requirements for specific log storage areas and their security of tenure, as recommended by the Log Management Activity Work Group.

(c) Establish a coordinated information bank and procedure for monitoring the sediment budget, as recommended by the Navigation and Dredging Activity Work Group.

(d) Implement a port and industrial development strategy through the area designation and area management planning process.

Objective 2: ***To implement a comprehensive recreation plan for the estuary.***

Tasks:

(a) Priorize and facilitate implementation of the action plans proposed for the sixteen recreation units in the Proposed Recreation Plan, as recommended by the Recreation Activity Work Group.

(b) Establish recreation plan agreements with participating municipalities, government agencies, port authorities and private landowners.

(c) Prepare an estuary-wide interpretive and communication plan for a system of recreation sites and corridors in the estuary, which takes account of the recreation and environmental education goals recommended by the Activity Work Groups;

(d) Implement the Recreation Plan recommendations through the area designation and area management planning process.

Objective 3: ***To implement a comprehensive habitat plan for the estuary.***

Tasks:

(a) Develop a habitat protection and conservation policy for the estuary, as recommended by the Habitat Activity Work Group.

(b) Prepare an inventory of specific habitat restoration and enhancement opportunities in the estuary.

(c) Prepare a detailed habitat research agenda, in consultation with the Waste Management/Water Quality Committee.

(d) Implement a Habitat Plan through the area designation and area management planning process.

Objective 4: ***To establish cooperative area management plans and designations to guide future water and land use in the estuary.***

Tasks:

(a) Integrate the land and water use aspects of the port and industrial development strategy, the recreation plan and the habitat plan, and determine priorities and boundaries for area management plans.

(b) Formulate preliminary area designation maps in consultation with local and regional government, local advisory planning commissions and the public.

(c) Establish area designation agreements with local municipalities, Provincial and Federal agencies and port authorities.

(d) Prepare area management plans for specific areas, as directed by the Management Committee.

5.5.2 Water Quality/Waste Management Committee

This proposed committee will be responsible for implementing three products:

(1) Water Quality Plan which will implement a comprehensive program of Water Quality Objectives and environmental monitoring of water, sediments and biota, and reporting of water quality conditions in the estuary.

(2) Waste Management Plan which will establish coordinated local, Provincial and Federal government policies and practices for pollution abatement and the management of waste discharges in the estuary, and develop and implement a Compliance and Surveillance Strategy.

(3) Environmental Emergencies Framework which will set out arrangements for contingency planning, preparedness exercises and response procedures amongst the agencies, industries and groups involved in environmental emergencies such as oil and chemical spills.

Proposed Water Quality/ Waste Management Committee members:

Ministry of Environment, Lands and Parks (B. C. Environment)(chairman)
Department of Fisheries and Oceans
Environment Canada
Greater Vancouver Regional District
Ministry of Agriculture and Fisheries
B. C. Ministry of Health
Municipal Representatives

Several Subcommittees may also be formed to address specific issues (e.g. monitoring). These Subcommittees would have invited representation from various agencies and special interest groups.

The objectives and tasks of the Committee are as follows.

Objective 1: ***To implement a comprehensive water quality plan for the estuary.***

Tasks:

(a) To review and revise as necessary the Water Quality Objectives for the estuary, according to the process as recommended by the Water Quality Plan Standing Committee.

(b) To coordinate the implementation of the proposed three-year environmental monitoring program,including issuance of annual environmental quality report cards and a status of water quality report every three years, as recommended by the Water Quality Plan Standing Committee.

(c) To undertake an inventory of areas of contaminated sediments in the estuary, as recommended by the Navigation and Dredging Activity Work Group.

(d) To develop management guidelines for log towing, dumping and storage, as recommended by the Log Management Activity Work Group. [possibly Water and Land Use Committee]

(e) To revise, as appropriate, and to monitor the use of the Fraser River Dredging Guidelines.

(f) To identify research needs and coordinate special studies into water quality, as recommended by the Water Quality Plan Standing Committee.

Objective 2: ***To implement a comprehensive waste management program for the estuary.***

Tasks:

(a) To review, and where appropriate, propose revisions to regulatory and policy mechanisms for waste management and pollution control, as recommended by the Waste Management Activity Work Group.

(b) To coordinate and assist in the implementation of proposed capital programs for pollution abatement and waste disposal in the estuary, as recommended in the Waste Management Activity Plan.

(c) To undertake management improvements related to database, administration and education, as recommended in the Waste Management Activity Plan.

(d) To document and implement a coordinated compliance monitoring and surveillance strategy for the estuary as recommended in the Waste Management Activity Plan.

(e) To review debris control plans and determine the need for any additional debris control measures, as recommended by the Log Management Activity Work Group.

(f) To identify specific research needs and to promote research into waste management.

Objective 3: ***To establish a coordinated environmental emergencies planning and response framework for the estuary.***

Tasks:

(a) To develop an area-wide spill response plan and inter-agency agreement, as recommended by the Environmental Emergency Activity Work Group.

(b) To establish a funding mechanism for coordinated emergency response.

(c) To identify additional equipment needs for environmental emergencies.

(d) To implement joint training programs and preparedness exercises for environmental emergencies.

(e) To develop a media plan for environmental emergencies.

(f) To identify needed improvements to spill modelling systems.

5.5.3 Environmental Review Committee

This committee is a continuation of the existing Environmental Review Committee. Members of the Committee are:

Environment Canada (chair)
Ministry of Environment, Lands and Parks
Fisheries and Oceans Canada

Objectives:

To ensure coordinated government referral and review of proposed development projects.

To ensure consistent and clear environmental information requirements and review procedures for proposed development projects.

Through the Secretariat, provide opportunities for the public to review and comment on proposed development projects.

Tasks:

(a) Through the Secretariat, maintain a Central Project Registry of project proposals.

(b) Develop a public notification process for project applications.

(c) Provide an annual report on ERC activities.

(d) Develop a monitoring program to ensure compliance with ERC recommendations.

5.6 IMPLEMENTATION ADVISORY COMMITTEE

This Committee would meet at least once a year at an Annual Workshop (during Environment Week) to review progress in implementing the Management Program and to provide a forum for discussing estuary management concerns. While each agency, municipality, regional district and Indian Band would appoint a representative to this Committee, the Annual Workshop would also be open to Mayors and Regional District Board members and elected native leaders.

5.7 TECHNICAL ADVISORY COMMITTEE

The proposed terms of reference of the committee are:

(a) to review the preliminary results of the port and industrial development strategy, the recreation plan and the habitat plan and to advise on implementation procedures.

(b) to provide assistance in the preparation of area designation agreements and area management plans.

(c) to provide review of reports and issues, as requested by the Management Committee.

5.8 ROLE OF LOCAL AND REGIONAL GOVERNMENTS, INDIAN BANDS, OTHER GOVERNMENT AGENCIES AND NON-GOVERNMENTAL ORGANIZATIONS

The successful implementation of recommendations and timely completion of the proposed activities outlined above will require the cooperation of many different interests. FREMP is a coordinating body and as such is meant to facilitate responsible management of the Fraser estuary as embodied in its goals and objectives. FREMP is committed to working very closely with all affected levels of government, Indian Bands, non-government organizations and the general public.

One of the primary means for accomplishing its goals and for implementing many of the recommendations contained in the Activity Program reports will be through the Technical Committees outlined above. These committees will have the ability to appoint task forces, ad hoc groups and other similar bodies to address and assist in the implementation of certain activities (e.g. recreation plan). It is expected that these groups will involve a wide range of government and non-government interests.

Another major objective of FREMP is to prepare Area Management Plans for specific geographical areas (i.e. Boundary Bay, North Arm, etc.) within the FREMP area. These will be prepared jointly with municipalities and regional districts and will involve other agencies, Indian Bands and other organizations. Some progress has already been achieved through the FREMP area designation process with several municipalities. This work is expected to be accelerated under the next phase. The Area Management Plans are expected to be an important tool in integrating and implementing the recommendations of the Activity Program Work Groups and the follow-up work of the proposed Technical Committees.

APPENDIX I

FRASER RIVER ESTUARY MANAGEMENT PROGRAM: ACTIVITY PROGRAM RECOMMENDATIONS

		MONITORING & RESEARCH	POLICIES & GUIDELINES	AREA PLANS & DESIGNATIONS	PUBLIC INFORMATION & CONSULTATION
WORK GROUP RECOMMENDATIONS:					
Port and Industrial Development					
1.	Nodal development strategy			X	
2.	Land use efficiency measures			X	
3.	Coordinated land use planning				X
4.	Environmental responsibility			X	
5.	Public awareness & understanding				X
6.	Recreational land use support			X	
Navigation and Dredging					
7.	Navigation channel evaluation		X		
8.	Dredge disposal management plan		X		
9.	Monitoring the sediment budget	X			
10.	Dredging Guidelines revisions		X		
11.	Contaminated sediments research	X			
12.	Navigation advisory committee				X
Log Management					
13.	Debris control plans		X		
14.	Industry-recreation cooperation			X	
15.	Log storage area designation			X	
16.	Log storage riparian rights			X	
17.	Technological changes		X		
18.	Log towing restrictions		X		
19.	Log/barge dumping restrictions		X		
20.	Grounding guidelines		X		
Waste Management					
21.	Policy guiding principles		X		
22.	Pollution abatement		X		
23.	Database management	X			
24.	Education and public awareness				X
25.	Administration		X		
26.	Research directions	X			

		MONITORING & RESEARCH	POLICIES & GUIDELINES	AREA PLANS & DESIGNATIONS	PUBLIC INFORMATION & CONSULTATION
Water Quality					
27.	Water quality objectives	X			
28.	Environmental monitoring	X			
29.	Special studies	X			
30.	Quality assurance/control	X			
31.	Plan Coordinator/QC Office	X			
32.	Public education/involvement				X
Habitat					
33.	Protection and conservation		X		
34.	Restoration and enhancement		X		
35.	Management plans and programs			X	
36.	Public awareness				X
37.	Habitat research	X			
Recreation					
38.	Recreation plan principles		X		
39.	Recreation unit plans			X	
40.	Linear unit plans			X	
41.	Development policies		X		
42.	Communication and education				X
Environmental Emergencies					
43.	Spill response plan & agreement		X		
44.	Emergency response committee		X		
45.	Emergency response funding		X		
46.	North Fraser response equipment		X		
47.	North Fraser response manual		X		
48.	Spill training program		X		
49.	Spill modelling systems		X		
50.	Hazardous chemicals spills		X		

APPENDIX II

LIST OF ACTIVITY PROGRAM PARTICIPANTS AND REPORTS

ENVIRONMENTAL EMERGENCY ACTIVITY WORK GROUP

Members:

Environment Canada (chairman)
Department of Fisheries and Oceans
Ministry of Environment
Ministry of Attorney General - (Prov. Emerg. Program)
North Fraser Harbour Commission
Fraser River Harbour Commission
Port of Vancouver
City of Vancouver
Municipality of Burnaby
Municipality of Richmond
Municipality of Delta
Greater Vancouver Regional District

Reports:

Overview Study, Environmental Emergency Activity, Environmental Emergencies Activity Program, June, 1991

Emergency Review and Linkage Study, Bennett Environmental Consultants Ltd.,January, 1991

Spill Response Equipment Recommendations and Training Requirements for the Lower Fraser River, L.B. Solsberg Counterspill Research Inc., March, 1988.

Discussion Paper - Environmental Management Activity, Fraser River Estuary Management Program, Environmental Emergency Work Group, June 1987.

HABITAT ACTIVITY WORK GROUP

Members:

Department of Fisheries and Oceans (chairman)
Ministry of Environment (chairman)
North Fraser Harbour Commission
Fraser River Harbour Commission
Environment Canada
Will Paulik, Fraser River Coalition

Reports:

Report of the Habitat Activity Work Group, Dec. 21, 1990.

Proceedings of the FREMP Habitat Workshop, Richmond, B.C., June 27-28, 1990, R.U. Kistritz Consultants Ltd., 1990.

LOG MANAGEMENT ACTIVITY WORK GROUP

Members:

North Fraser Harbour Commission (chairman)
Department of Fisheries and Oceans
Environment Canada
Fraser River Harbour Commission
Ministry of Crown Lands
Ministry of Environment
Council of Forest Industries
Council of Marine Carriers
Vancouver Port Corporation

Report:

Log Management in the Fraser River Estuary, March 1991.

NAVIGATION AND DREDGING ACTIVITY WORK GROUP

Members:

Canadian Coast Guard (chairman)
Council of Marine Carriers
Department of Fisheries and Oceans
Environment Canada
Fraser River Harbour Commission
Ministry of Environment
North Fraser Harbour Commission
Pacific Pilotage Authority
Port of Vancouver
Public Works Canada

Report:

Navigation, Dredging and Environment in the Fraser River Estuary, January 1991.

PORT AND INDUSTRIAL DEVELOPMENT ACTIVITY WORK GROUP

Members:

Fraser River Harbour Commission (chairman)
North Fraser Harbour Commission
Port of Vancouver
City of New Westminster
City of Port Coquitlam
City of Richmond
City of Vancouver
City of White Rock
District of Burnaby
District of Surrey
Municipality of Delta
Municipality of Maple Ridge
Municipality of Pitt Meadows
Township of Langley
Greater Vancouver Regional District
Canadian Coast Guard
Ministry of Crown Lands
Ministry of Highways and Transportation
Public Works Canada

Report:

A Recommended Port and Industrial Development Strategy, February, 1991

Port/Industrial Land Supply and Demand Study, July, 1990

RECREATION ACTIVITY WORK GROUP

Members:

Greater Vancouver Regional District (chairman)
Vancouver Parks Board
City of Richmond
Corporation of Delta
District of Surrey
District of Pitt Meadows
Corporation of Burnaby
District of Coquitlam
City of Port Coquitlam
Municipality of Langley
Municipality of Maple Ridge
Dewdney Alouette Regional District
Ministry of Environment
Ministry of Crown Lands
Federation of B.C. Naturalists
B.C. Wildlife Federation
Save Our Parklands Association

Report:

Proposed Recreation Plan, April, 1990

WASTE MANAGEMENT ACTIVITY WORK GROUP

Members:

B.C. Ministry of Environment (chairman)
Department of Fisheries and Oceans
Environment Canada
District of Burnaby
City of Richmond
Greater Vancouver Regional District
Ministry of Agriculture and Fisheries

Reports:

A Recommended Waste Management Activity Plan, October, 1990.

Agricultural Runoff Contamination in the Fraser River Estuary, Discussion Paper, December 1990.

Potential Surface Water Contamination From Miscellaneous Sources in the Fraser River Estuary, Background Paper, December, 1990.

Potential Groundwater Contamination in the Fraser River Estuary, Discussion Paper, December, 1990.

STANDING COMMITTEE ON THE FRASER RIVER ESTUARY WATER QUALITY PLAN

Members:

Department of Fisheries and Oceans (chairman)
Environment Canada
B.C. Ministry of Environment
Greater Vancouver Regional District

Reports:

Water Quality Plan, Monitoring and Objectives, April 1991.

Status Report on Water Quality in the Fraser River Estuary, 1990

Third Annual Fraser River Estuary Workshop on Monitoring and Research, August 1989.

Summary of Monitoring and Research Activities and Proceedings-Fraser River Estuary Workshop on Monitoring and Research, November 1988.

Status Report on Water Quality in the Fraser River Estuary, 1987.